

19



Europäisches Patentamt  
European Patent Office  
Office européen des brevets

11

Publication number:

**0 033 718**  
**A2**

12

## EUROPEAN PATENT APPLICATION

21 Application number: 81810021.6

51 Int. Cl.<sup>3</sup>: A 23 G 1/00

22 Date of filing: 27.01.81

30 Priority: 30.01.80 CH 731/80

43 Date of publication of application:  
12.08.81 Bulletin 81/32

84 Designated Contracting States:  
AT BE CH DE FR GB IT LI NL SE

71 Applicant: BATTELLE MEMORIAL INSTITUTE  
7 route de Drize  
CH-1227 Carouge/Genève(CH)

72 Inventor: Giddey, Claude  
59, route de Chêne  
CH-1208 Geneva(CH)

72 Inventor: Dove, Georges  
1, Quai du Cheval Blanc  
CH-1227 Carouge(CH)

74 Representative: Dousse, Blasco et al,  
7, route de Drize  
CH-1227 Carouge/Genève(CH)

54 A chocolate composition for the preparation of heat-resistant chocolate articles, a process for its manufacture and its working into foodstuff articles.

57 A composition for casting heat-resistant chocolate articles which contains, further to usual ingredients of chocolate, an emulsion of water in a fat substance, said emulsion being dispersed in the composition and, at least in part, in solid form.

This composition is made by dispersing into an ordinary chocolate molten mixture an emulsion of water in a fat substance, e.g. cocoa-butter, said emulsion being in solid particulate form or in the form of a cream.

EP 0 033 718 A2

A CHOCOLATE COMPOSITION FOR THE PREPARATION OF  
HEAT-RESISTANT CHOCOLATE ARTICLES, A PROCESS FOR ITS  
MANUFACTURE AND ITS WORKING INTO FOODSTUFF ARTICLES

Field of the invention

The present invention concerns the field of foodstuff articles, especially of chocolate which resists, without softening, to summer temperatures or to that of tropical countries. Such a chocolate is  
5 often called "tropicalized" chocolate.

The present invention has more particularly for object a composition of chocolate for the preparation of tropicalized chocolate articles and a method for its manufacture. It has also for object its putting into work for making chocolate articles as well as the  
10 latter.

Background of the art

Ordinary chocolate is composed of fats or fatty substances (cocoa-butter) in which there are dispersed non fat products such as cocoa components (cellulosic substances, flavors, theobromine, etc..),  
15 sugars, proteins (that of milk, for instance). Besides, there can be present in chocolate also various ingredients (fruits, peeled almonds, hazelnuts, special aromas, etc..). Thus, the main phase of chocolate is constituted by fat bodies and its melting temperature is generally not high. Thus, when this phase essentially comprises  
20 cocoa-butter (a mixture of stearyl, oleyl, palmityl and linoleyl glycerides) it starts softening at 28°C with consecutive loss of strength of the whole mass of chocolate. This mass does no more neatly "break", it tends to flow and sticks unpleasantly to the wrapper. Furthermore, after cooling, there can form, at the surface of the chocolate  
25 some growths of crystallized cocoa butter (blooming) which look like molds.

One has sought to remedy such drawbacks in many ways, for instance by selecting fats of higher melting points or, better, by methods mainly based on disrupting the continuous chocolate fatty phase in order to minimize the influence of the melting thereof on the  
30 overall softening of the mass of chocolate. Thus, such breaking can be obtained by increasing, in the mass, the content of hygrophilic ill melting substances, that is to say, by causing the formation,

in the mass, of either fully embedded (phase inversion) fat particles by ill melting bodies (the fatty phase is then fully discontinuous), or of a grid-like network in which the fatty phase will stay enclosed (trapped), somewhat like a liquid in a sponge when it is soaked  
5 therewith.

Highlights of the Prior-Art

Thus, Swiss Patent No. 410.607 (MARS) discloses a chocolate composition containing hygrophilic substances such as dextrose, maltose, inverted sugar, fructose, xylose, mannitol, sorbitol, etc.. When  
10 the chocolate articles have been cast with such a composition, they are thereafter exposed to a moist atmosphere whereby they absorb a certain quantity of water which causes a relative increase of the volume occupied by the hydrophilic substances and an improvement of the heat resistance of the chocolate.

15 In Swiss Patents Nos. 399.891 and 489.211, there is disclosed a method which consists in incorporating amorphous sugars into a chocolate composition under manufacture, these sugars causing the formation in the mass, by thermal treatment, of a lattice which prevents collapsing of the mass when the temperature exceeds the melting point  
20 of the fat bodies used for its preparation.

Furthermore, there is described in Swiss Patent No. 409.603 the direct incorporation of water into a chocolate composition during its manufacture. This water, the quantity of which is about 5% relative to the composition, causes a rapid thickening thereof at the  
25 temperatures where it is, normally, still a liquid (about 30°C), wherefrom there is then no more possible to use the composition to cast chocolate articles into molds. The composition must then be ground and the obtained powder is put into shape by compression molding. This process is a typical example of inverted structure, i.e. a case  
30 se where the fats of the chocolate are practically all embedded within the matrix of the hydrophilic ill fusible substances. One finds similar processes described in Swiss Patent No. 405.908 and German Patent DRP No. 389.127.

According to USP 2,760,867, one can incorporate water into chocolate under manufacture by using, in addition, an emulsifier such  
35 as lecithin. Now, in USP 4,081,559, there is added to chocolate such an amount of sugar that, when the quantity of water required to ob-

tain a tropicalized chocolate is added, there is formed an aqueous sugar solution in which at least one edible fat (of the chocolate) is emulsified.

According to another process described in Swiss Patent

5 No.519.858, fat bodies are incorporated, into a chocolate composition, in the encapsulated state, i.e. within vesicles or microbeads having a diameter below 2 mm and made of a non liposoluble edible envelope, which technique enables obtaining a heat resistant chocolate.

10 The methods of the prior-art are operative but they have, however, some drawbacks: thus, they either require thermal treatments or storage under humid conditions for rather long periods which is little economical. Otherwise, they require the addition of unusual additives or they impart to the chocolate a coarser or rougher structure which is a sign of deficiency in quality.

Description of the invention and some embodiments thereof

The present invention remedie these defects because:

a) it brings little or no change regarding the chocolate manufacture duration;

20 b) it introduces no particular substance normally foreign to the composition of the chocolate;

c) the taste feeling of the chocolate articles thus achieved is, practically, not different from that of similar articles obtained from a classical mass of chocolate containing the same ingredients  
25 in identical proportions.

The composition of chocolate according to the invention for the preparation of tropicalized chocolate articles, for instance by casting into molds or by enrobing chocolate articles, comprises, dispersed in its mass, particles constituted of an emulsion of the type "water in fat". Generally, this fat, in the solid or partly molten state, is cocoa-butter the main fraction of which constitutes the fat phase of the chocolate. However, other fats which may possibly be used in chocolate manufacture are also convenient. Indeed, when articles of chocolate are cast from this composition, the emulsion formed by partially or totally solid particles dispersed within the composition will eventually liberate the water trapped therein in the form of a suspension of very fine droplets, which water will gene-

rate, together with the hydrophilic solids of the composition, a kind of lattice enclosing the phase of fats. This liberation of the water droplets occurs when the particles of the "water in fat" emulsion are resorbed and vanish in the mass due to their being put in  
5 contact with the liquid warm chocolate undergoing solidification. When the temperature is thereafter raised, this network in the solidified chocolate opposes against collapsing of the structure despite the melting of the fat phase. The above explanation given here is actually hypothetical because, up to now, no marked difference  
10 ce of taste and physical aspect has been found between the chocolate thus obtained and the same chocolate obtained by the classical route. A fundamental difference however exists: the softening temperature. Thus, although the chocolate obtained by the classical techniques markedly softens around 28°C and melts at slightly higher temperatures,  
15 peratures, the same chocolate generated from the above-disclosed composition remains surprisingly stiff at 50°C and even above. Strange enough, this difference of texture is hardly noticeable by taste and the chocolate thus tropicalized melts in the mouth nearly like ordinary chocolate. This is perhaps due to the fact that, during  
20 manufacture, the particles of the emulsion will act, at least in part, as normally expected from the cocoa-butter crystallites which form during tempering of the mass.

The method for manufacturing the composition of the invention is the following: a chocolate composition is first prepared with usual  
25 ingredients according to usual means. Then, it can, or not, be subjected to tempering. In regard to tempering, it is reminded that this consists in generating within the liquid chocolate mass cocoa-butter "crystallization germs" or crystallites and this is achieved by temporarily lowering the temperature of the molten mass from about  
30 30°C to about 25-27°C under stirring. Then, according to one embodiment for implementing the invention, once the mass has been tempered and further brought up to 29-31°C, there is added 1 to 4% by weight of an emulsion of water in cocoa-butter, as described above, under vigorous stirring to ensure a homogeneous dispersion of the  
35 particles and the composition is subjected to working before the emulsion particles containing the water have a chance to be destroyed by the agitation or by melting completely. According to another embo-

diment for achieving the method of the invention, there was noticed that it was not necessary that the conged chocolate mass be tempered beforehand for obtaining the desired results. Indeed, it is then sufficient to bring the mass to an appropriate temperature where cocoa-butter particles do not rapidly melt (i.e. are in fusion equilibrium with the liquid) and, at this temperature, to add the above-mentioned emulsion, at least some of the particles thereof acting therein like the crystallization germs mentioned hereintofores which normally result from the tempering operation. Naturally, also in this case, the composition must be put into work rapidly before the particles of the partly solid emulsion have disintegrated due to melting or to mechanical disruption within the agitated mass. Fortunately, such disablement of the composition is not rapid because, in any case, the liquid mass is in practical equilibrium with the cocoa-butter crystallites at the temperatures considered. However, keeping the composition too long under agitation before putting it to use is undesirable since a prolonged agitation impairs the tropicalization phenomenon, perhaps because the network mentioned before is broken. Subjecting the composition of the invention to temperature above 30° for any substantial length of time should also be avoided because this also destroys the tropicalization effect; this is probably due to a fast melting of the emulsion solid particles, re-distribution of the water in the mass and the premature formation of a hydrophilic phase which is undesirable at this stage because of its viscosity which is very high (it is quite possible that, in this case, the physical conditions are similar to that of having water directly incorporated into the chocolate mixture as in the prior-art, e.g. Swiss Patent No. 409.603). Hence, regarding this aspect of the question, the temperature should be watched carefully right after adding the emulsion to the mass since there was noticed, at that time, a sudden significant jump in temperature (heat evolution) which may require to be controlled by cooling.

Preferred conditions for achieving the invention

The emulsion of water in fat which is used in the above-mentioned preparation can be any, however, of preference, the water droplets thereof have a size of about 0.1 to 100  $\mu\text{m}$ . Preferably, the quantity of water relative to that of fat will be between 30 and 80%,

but these values can be modified if necessary and are in no way critical. What is critical, by contrast, is that only an emulsion of "water in fat" can be used in the invention and not an emulsion of "fat in water", by opposition. This limitation is quite evident since the objective is to stabilize the emulsion once formed and to trap the water droplets within the fat long enough for the composition to be put to work, i.e. to be cast definitively, all this before the water has the opportunity to bind with the non fat bodies of the chocolate. Also, there should be avoided to use, when preparing the emulsion, too high water-to-fat ratios as, in such cases, it may become difficult to achieve a good emulsion. On the other hand, using too low water-to-fat ratios should also be avoided since, in such cases, the amount of emulsion to be added to the mass of liquid chocolate for achieving a given proportion of water therein might become too large, thus supplying to the composition a quantity of fat which is exaggerated and incompatible with the manufacture of a chocolate of good quality. Furthermore, too much fat in the chocolate could harm the tropicalization efficacy. In this connection, it should be remarked that according to some references, adding a water-oil emulsion to the chocolate will impart fluidity thereto which appears to contradict the observations on which the present invention is based (see for instance French Patents Nos. 1.099.864 and 2.021.299). It can consequently be assumed that in said references the emulsions mentioned rather refer to "oil-in-water" emulsion types rather than the "water-in-oil" emulsion types used here. Incidentally, it should also be mentioned that in Dutch Patent No. 82.891, there is reported that "water-in-oil" emulsions are usable in the manufacture of cosmetics and food-products, e.g. chocolate. Tropicalized chocolate is however not mentioned in this reference.

30       The amount of water which is added in the present invention relative to the total of the composition is in the order of 1 to 4% by weight. Lower levels have not much practical effect and higher levels may undesirably raise the viscosity of the tempered chocolate mass before casting and may, possibly, impart to the chocolate a grainy structure as compared to that of ordinary chocolate, which is a thing that one wants normally to avoid. Of course, if it is desired to willingly obtain a chocolate with a texture different from

that of ordinary chocolate, then one can add more than 4% of water.

As the fat of the present emulsion, cocoa-butter can be used preferentially but other fatty substances known in the manufacture of chocolate can also be used.

5       The emulsion "water-in-fat" required for achieving the invention can be obtained as follows: first, the selected quantity of water is emulsified within the fat body. For this, the water is added to the fluidized fat under violent agitation in an emulsifying apparatus. The term "fluidized fat" or "fluidized fat substance" used  
10 here defines a condition whereby the fat is liquid like but not necessary completely melted because, if this were so, the emulsion would be more difficult to be obtained and would also be less stable. Therefore, it is highly preferable that the fatty phase in the fluid state should contain, as a dispersion therein, a certain proportion  
15 of solidified fat in equilibrium with the liquid, such solid fraction being obtained, as is the case when subjecting chocolate to tempering, by a controlled temporary cooling of the priorly fully molten fatty substance.

Once the emulsion is obtained, it can be made to acquire the  
20 consistency of a rather thick cream such that the emulsified water droplets be well embedded in the solid fat, this being so for avoiding too fast a binding of the water, when added to the chocolate, with the non fatty solids thereof and the tropicalization to be premature.

25       Otherwise, as a modification, the emulsion can be more fully cooled, for instance around 10°C, so that it acquires a fully solid crystalline structure. The solid emulsion block thus obtained is then ground into a powder by usual means, e.g. by milling or grinding. This powder can be stored before use for a prolonged period and can  
30 be supplied to potential users who wish to manufacture tropicalized chocolate.

Whichever the form of the "water-in-fat" emulsion, the latter is added to the mass of conged chocolate (tempered or not tempered previously) for preparing the composition according to the invention  
35 and it is rapidly dispersed therein.

For putting the present composition into work, it is taken for casting chocolate articles or for enrobing confectionery sweets or



other foodstuffs (e.g. cookies, etc..). The techniques required for this working are absolutely identical with that normally used for ordinary tempered chocolate compositions. For instance, the composition is poured into molds and allowed to cool slowly. For doing  
5 this, and for the other applications (enrobing, coating, decorating) there exists many automatic machines which are well suitable. It is only essential that the composition of the invention should not be kept unused for too long in the liquid state.

The articles of chocolate obtained from the composition of the  
10 invention are, after solidification, perfectly tropicalized and will resist, without noticeable alteration, to several weeks of storage at temperature of 40 - 50°C (average) and even more, the only harm due to prolonged storage at high temperature being a slight loss of the original gloss. It should be remarked that the tropicalization  
15 effect obtained according to the invention amplifies itself with time. It reaches a stable maximum after about 2 weeks at 15 - 20°C or after one to two days at 27 - 28°C.

#### Reduction to practice

The following examples illustrate the invention:

#### 20 Example 1

##### a) Preparation of an emulsion of water in a fatty material

In a container provided with a stirrer, 1 kg of cocoa-butter was melted by heating to 50°C. Then, the liquid was tempered by cooling to 26° and keeping such temperature until it became milky due  
25 to the crystallization of the less fusible portions of the fat, i.e. formation of "crystallization germs". Then, it was brought to 29 - 31°C in order to avoid its complete solidification, the milky liquid being in some kind of equilibrium at this temperature.

The liquid was placed into a high-speed emulsifier of the "mix-  
30 er" type and, while violently stirring at approximately 30°C, there was added 1-2 g of soy lecithin and one liter of water. Mixing was continued until the desired emulsion was formed which had the aspect of a mellow cream between 29 and 31°C. The cream was cast into a mold at room temperature, slightly shaken for removing air bubbles  
35 and allowed to stand for 30 to 60 min at 10°C. After this period, the mass was in form of a solid block which could be lifted and stored at room temperature.

After at least 24 hrs of storage, the block was milled or ground by usual means (in a milling or grinding machine), so as to obtain a powder of particles or chips of about 1 to 3 min. This powder can be used for the next operations or it can be stored at 10 - 20°C for a prolonged period.

b) Preparation of a tropicalized chocolate composition

In an appropriate container provided with a stirrer, there was placed 10 kg of a mass of milk chocolate of current commercial grade taken, from a conge, in liquid form. In the present Example, the milk-chocolate had the following constituents (by weight): fatty substances 32% (26% of cocoa-butter plus 6% of milk fats); skin milk solids 11%; non fatty solids and other substances from cocoa 29%; sugars 27%; moisture 0.4 - 0.6%. The chocolate was liquid at 55°C and, while stirring, it was subjected to the tempering operation, i.e. it was cooled to 26°C to initiate the formation of cocoa-butter crystallites, then it was reheated to 29.5°C. In such condition, the mass was well fluidized and, still under agitation, there were added in streaks (for 15 - 30 sec) 400 to 500 g of the solid powder of the water in cocoa-butter emulsion, the preparation of which has been described above. Agitation was continued for a few minutes to ensure that the distribution of the powder be homogeneous and the whole was kept under these conditions only for the time necessary for putting it to work. It should be noted that although the powder is present in the mass under liquid-solid equilibrium conditions, and although in the presence of cocoa-butter crystallites it has no particular tendency to melt rapidly, it should be put rapidly into use because its stability is time limited (15 - 30 min approximately). It should also be remarked that it is important to correctly order the steps of the procedure as described above. If tempering the chocolate mass has not been carried out before adding the emulsion, this should preferably be omitted. Indeed, if the solid emulsion powder is added at 29 - 31°C to the chocolate mass before tempering and that the tempering operation is carried out afterwards, the tropicalization effect on the chocolate is strongly decreased, if not lost completely. Also, heating the present composition, before its being put into work, at temperatures exceeding about 31 - 32°C should be avoided for fear of rapidly losing the tropicalization effect.

c) Putting the tropicalized chocolate composition into use

Without further delay, the above liquid composition was cast into molds for molding chocolate bars and the whole was allowed to cool slowly according to usual techniques. After about one night rest, the bars were lifted and it was noted that the aspect of the chocolate was identical with a control chocolate that was prepared under the same conditions and from the same conged mixture, except for the above tropicalization treatment.

The tropicalized chocolate and the control chocolate were submitted to a group of experienced testers who declared not to detect appreciable differences between the two types of chocolate.

d) Heat resistance tests

1. Several samples of chocolate cast from the above described composition and corresponding controls of identical overall compositions, but having not been subjected to the tropicalization treatment, were heated for 1 - 2 hrs at 40°C in an appropriate oven. Then, the samples were subjected to a "penetration" test which consists in placing on the surface of the sample a piercing device with a vertical needle on which a progressive force is applied until a standard penetration into the chocolate (in the case, 3 mm) is achieved. For the control chocolate an average force of 6 g was measured whereas on the same chocolate, but tropicalized, an average force of 58 g was measured.

2. Samples of tropicalized chocolate and controls were kept overnight at 50°C in an oven. The samples under test were examined and showed no sign of appreciable deterioration; for instance, the bars still broke giving neat pieces as if the temperature was not over 15 - 20°C. In contrast, the controls had a doughy look and were collapsing completely.

3. Packed tropicalized chocolate bars were stored in the boot of an automobile which travelled for 15 days during the summer time the west and the center of the USA, the car staying many times in full sunshine in parking lots. After this treatment, the chocolate was examined and only a slight loss in shine and gloss was noticed. The chocolate body was not distorted and had no "fat bloom" deposit.

It must be noted that the chocolate thus tropicalized does not

easily return to its structure of ordinary non-tropicalized chocolate. This can however be achieved by lengthily crushing and mixing the tropicalized chocolate at a temperature of 50 - 55°C. The water slowly evaporates and the mass comes back then to the prime state  
5 of liquid chocolate analogous to that chocolate taken right out of the conge; from this state, it can be tropicalized again if desired.

It should also be noted that if, in the chocolate used in the present Example, there is added, after tempering, a quantity of free  
10 water of approximately 2 to 3% by weight (this amount is of the order of what is added according to the invention), the consecutive increase in viscosity of the mass is such that it cannot be kneaded any more and, with greater reason, it can no more be cast into molds.

15 If, in the present Example, the tempering step is omitted, i.e. if the 10 kg chocolate mass just withdrawn from the conge is simply brought to about 30°C and the powder of solid emulsion of water in cocoa-butter is added, the tropicalization effect is about the same and the quality (taste and structure) of the obtained tropicalized  
20 product is practically not impaired. Presumably, the small particles of the powdered emulsion act, when added to the liquid chocolate, somewhat as if they were the crystallization germs the formation of which is normally induced by tempering.

#### Example 2

25 A known commercial grade of chocolate (fats 32%, non fat solids 18%, sugars 50% (all by weight), no milk) was selected and 10 kg thereof was taken off a conge and treated with 400 g of an emulsion of water in cocoa-butter (H<sub>2</sub>O 50% by weight) exactly as described in the previous Example. After casting chocolate articles with the above  
30 tropicalized composition, samples were subjected to the "penetration" test mentioned hereintofores and an average value of 16,3 g was found at 40°C (6 g for the controls).

#### Example 3

35 In a stirred container, there was liquefied at 50°C one kg of cocoa-butter. Then, it was tempered at 26°C and, after further heating to 29 - 30°C, there was emulsified in the milky mass one liter of water in the presence of a little lecithin, all being in accord

with the description under part a) of Example 1. Agitation was continued while the temperature was slightly lowered until a mellow cream was obtained which was then added with efficient stirring to 10 kg of a liquid mass of conged chocolate as described in part b) of Example 1. Then, when the mass was well homogenized, it was cast into molds for molding chocolate articles and it was allowed to rest overnight at 10 - 15°C. The cast articles were then lifted, they were packed according to usual practice and the wrapped products were stored for 48 hrs at 27°C for optimalizing the tropicalization state.

10 The articles thus tropicalized behaved very similarly to that described in Example 1.

CLAIMS

1. A chocolate composition for the manufacture of thermo-resistant chocolate articles comprising, dispersed within its mass and in addition to the usual ingredients of chocolate, particles constituted of an emulsion of "water in a fat substance", at least part of  
5 this fat substance being in solidified form.

2. The composition of claim 1, comprising 2 - 10% by weight of said emulsion.

3. The composition of claim 1, wherein said emulsion contains 30 to 80% by weight of water.

10 4. A method for manufacturing a chocolate composition for the preparation of thermo-resistant chocolate articles, which comprises dispersing into a mass of conged chocolate, tempered or not tempered, an emulsion of "water in a fat substance", of which at least a fraction is in solidified form, such dispersing being carried out  
15 at a temperature where said mass, although in fluid form, is in a condition of melt equilibrium with the crystallization germs of the fat substance therein.

5. The method of claim 4, wherein said emulsion is under the form of a powder of particles of the fat substance in the solid microcrystalline state, this powder being dispersed by agitation with-  
20 in the mass of conged chocolate.

6. The method of claim 4, wherein said emulsion is in the form of a fluid cream containing, besides the emulsified water droplets, part of said substance in solidified form and the rest in liquid form.

25 7. The method of claim 4, wherein said emulsion is incorporated into the fluid mass of chocolate at a temperature of 26 to 32°C.

8. The method of claim 4, wherein the size of the water droplets in said emulsion is about 0.1 to 100  $\mu$ m.

9. The method of claim 5, wherein the size of the powder particles is about 1 to 5 mm.  
30

10. The method of claim 5, whereby said powder is obtained by emulsifying water into a fat substance, the latter being in a fluidized state, by cooling until the fat substance has a microcrystalline consistency and by grinding said emulsion once solidified in-

to a powder.

11. The method of claim 6, whereby said cream is obtained by emulsifying water into the fatty substance, the latter being in a fluidized state, then by cooling progressively said emulsion until  
5 the consistency of a mellow cream is obtained.

12. Working of the composition of claim 1 for manufacturing thermo-resistant chocolate articles, which comprises casting said composition in fluid form into molds and, thereafter, allowing to solidify by cooling, or using said composition for enrobing foodstuff  
10 articles: cookies, candies, pralines, cakes, etc...

13. Tropicalized chocolate article or article containing tropicalized chocolate as resulting from the working to claim 12.

CLAIMS

1. A method for manufacturing a chocolate composition for the preparation of thermo-resistant chocolate articles, which comprises dispersing into a mass of conged chocolate, tempered or not tempered, an emulsion of "water in a fat substance", of which at least a  
5 fraction is in solidified form, such dispersing being carried out at a temperature where said mass, although in fluid form, is in a condition of melt equilibrium with the crystallization germs of the fat substance therein.

2. The method of claim 1, wherein said emulsion is under the  
10 form of a powder of particles of the fat substance in the solid microcrystalline state, this powder being dispersed by agitation within the mass of conged chocolate.

3. The method of claim 1, wherein said emulsion is in the form of a fluid cream containing, besides the emulsified water droplets,  
15 part of said substance in solidified form and the rest in liquid form.

4. The method of claim 1, wherein said emulsion is incorporated into the fluid mass of chocolate at a temperature of 26 to 32°C.

5. The method of claim 1, wherein the size of the water droplets in said emulsion is about 0.1 to 100  $\mu\text{m}$ .

20 6. The method of claim 2, wherein the size of the powder particles is about 1 to 5 mm.

7. The method of claim 2, whereby said powder is obtained by emulsifying water into a fat substance, the latter being in a fluidized state, by cooling until the fat substance has a microcrystalline consistency and by grinding said emulsion once solidified into a powder.  
25

8. The method of claim 3, whereby said cream is obtained by emulsifying water into the fatty substance, the latter being in a fluidized state, then by cooling progressively said emulsion until the consistency of a mellow cream is obtained.  
30

9. Working of the composition obtained by the process of claim 1 for manufacturing thermo-resistant chocolate articles, which comprises casting said composition in fluid form into molds and, the-



reafter, allowing to solidify by cooling, or using said composition for enrobing foodstuff articles: cookies, candies, pralines, cakes, etc...



(12) **EUROPEAN PATENT APPLICATION**

(21) Application number: 81810021.6

(51) Int. Cl.<sup>3</sup>: **A 23 G 1/00**

(22) Date of filing: 27.01.81

(30) Priority: 30.01.80 CH 731/80

(43) Date of publication of application:  
12.08.81 Bulletin 81/32

(88) Date of deferred publication of search report: 12.05.82

(84) Designated Contracting States:  
AT BE CH DE FR GB IT LI NL SE

(71) Applicant: **BATTELLE MEMORIAL INSTITUTE**  
**7 route de Drize**  
**CH-1227 Carouge/Genève(CH)**

(72) Inventor: **Giddey, Claude**  
**59, route de Chêne**  
**CH-1208 Geneva(CH)**

(72) Inventor: **Dove, Georges**  
**1, Quai du Cheval Blanc**  
**CH-1227 Carouge(CH)**

(74) Representative: **Dousse, Blasco et al,**  
**7, route de Drize**  
**CH-1227 Carouge/Genève(CH)**

(54) **A chocolate composition for the preparation of heat-resistant chocolate articles, a process for its manufacture and its working into foodstuff articles.**

(57) **A composition for casting heat-resistant chocolate articles which contains, further to usual ingredients of chocolate, an emulsion of water in a fat substance, said emulsion being dispersed in the composition and, at least in part, in solid form.**

**This composition is made by dispersing into an ordinary chocolate molten mixture an emulsion of water in a fat substance, e.g. cocoa-butter, said emulsion being in solid particulate form or in the form of a cream.**

0033718



European Patent  
Office

## EUROPEAN SEARCH REPORT

Application number

EP 81 81 0021

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	FR - A - 1 099 864 (H. DO) * abstract; column 2, paragraph 3; column 1, paragraph 3; examples * ---	1,11	A 23 G 1/00
X/D	CH - A - 409 603 (ETS. JACQUMAIRE) * page 1, lines 32-35,53-59; examples 1-4; claims 1-4 * ---	1,5, 11-13	
X	CH - A - 405 908 (ETS. JACQUMAIRE) * page 1, lines 32-41,44-47,60-63; examples 1-4; page 2, lines 22-39 * ---	1,5, 11-13	TECHNICAL FIELDS SEARCHED (Int.Cl. 3)
	NL - C - 82 891 (UNILEVER) * column 1, lines 1-5; examples 4,6; column 3, lines 20-28 * & BE - A - 510 509 (UNILEVER) ---	1,3, 12,13	A 23 G 1/00
	US - A - 2 760 867 (N.W. KEMPF et al.) * claim 1; column 5, line 63 to column 6, line 25 * ---	1,12, 13	
	US - A - 4 081 559 (M. STANLEY JEFFERY et al.) * column 2, lines 16-30; examples 1 and 3 * ---	1	CATEGORY OF CITED DOCUMENTS
	DE - C - 389 127 (W. SCHMIDT) * page 1, lines 11-65; claims * ---	1,12, 13	X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons
<div style="text-align: right;">./.</div>			&: member of the same patent family. corresponding document
<div style="text-align: center;">          The present search report has been drawn up for all claims       </div>			
Place of search The Hague		Date of completion of the search 20.01.1982	Examiner GUYON

0033718



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application number

EP 81 81 0021

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl.)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
	<p><u>FR - A - 2 298 958</u> (SHADE FOOD)</p> <p>* examples 3,4; page 6, lines 28-30 *</p> <p>---</p>	1,11	
A	<p><u>US - A - 3 851 083</u> (B.L. BROOKING et al.)</p>		
A	<p><u>FR - A - 2 021 299</u> (LAITERIES E. BRIDEL)</p> <p>-----</p>		
			TECHNICAL FIELDS SEARCHED (Int. Cl.)

